

Course Number: **ARC 6913**
Course Title: **Advanced Integrated Building Technology**
Academic Term: Spring 2026
Credits: 4
Class Periods: T/Th Periods 4-5 10:40am-12:35pm
Meeting Locations: AH 0415/17
Faculty: Jason Alread AIA, CDT, LEED AP jalread@ufl.edu
Office: AH 144. Hours- M/W 9:30-10:30am or by appointment. 352-294-1456

SYLLABUS

01. Course Description

This course focuses on integrated building technology as it relates to the design of a studio project. It builds on and incorporates prior coursework, requiring students to integrate speculative design thinking, health/safety/welfare in the built environment, regulatory context, environmental concerns, and technical knowledge.

02. Course Pre-Requisites / Co-Requisites

Successful completion of ARC 6241 "Advanced Graduate Architectural Design One" with a passing grade is a pre-requisite for enrollment in this course. Enrollment in "Advanced Graduate Architectural Design Two" concurrently is required to meet the NAAB criteria for this course.

03. Purpose of Course and Role within the Sequence

Advanced Integrated Building Technology reinforces previous building technology coursework, pairing and paralleling with the Grad 2 studio project as a Design Synthesis and Building Integration based on NAAB Student Criteria and Learning Objectives (SC 1,2,4,5,& 6 – see below). Students are expected to fully integrate the building technology assignments with their design projects, understanding that the coursework is not separate but in support and advancement of the overall project goals. The subject matter is intended to gather the knowledge from previous semesters of technical coursework and synthesize it into a design project, producing deliverables that work between the ideas generated in studio and testing them against the technical requirements of making buildings. Students are expected to approach the coursework as an opportunity to push their design intent further through the lens of technology as an integral part of the design process and not something separate or only in service of the design. Students are encouraged to use this comprehensive pairing of integrated design coursework to germinate scholarship and personal perspectives that will be expanded in future studios, the Thesis/PILOT, and into professional practice.

As a component of this course and the companion Advanced Design Studio Two course, students will be required to demonstrate that they are able to integrate both conceptual ideas and technical considerations. Student work must exhibit strong integrated technology thinking and an ability to develop design proposals that acknowledge and attend to a wide range of concerns required for the practice of architecture.

Weekly assignments will be provided outlining in more detail objectives and schedules in parallel with studio.

04. Course Objectives

By the end of this course, students will be able to:

- Integrate technology issues with design solutions and understand how they work together.
- Research multiple options to technical applications and understand the benefits and trade-offs of different choices.
- Relate initial budgets to long-term costs of operating buildings.
- Translate ideas into integrated buildings that have sophisticated architectural definition, including code & zoning compliance, clear structural ideas, passive and active environmental systems, circulation strategies, exterior envelopes, life safety systems, fire safety systems, accessible/universal access, and specific material qualities. Deploy architectural components both pragmatically and poetically.
- Develop detailed drawings that describe building assemblies with informed material choices.
- Navigate regulatory requirements of zoning and codes for the advancement of the project.
- Make decisions on building design based on measurable environmental impacts.
- Understand and employ resilient design strategies and standards.

05. NAAB Student Criteria (SC) + Student Learning Objectives and Outcomes Addressed in this Course ¹

Through assignments completed for this course paired with the Advanced Graduate Design Studio Two, students will be required to demonstrate that they have an ABILITY to do the following:

SC.5 **Design Synthesis**— Ability to make design decisions within architectural projects while demonstrating synthesis of user requirements, regulatory requirements, site conditions, and accessible design, and consideration of the measurable environmental impacts of their design decisions.

¹ Student Criteria are from the 2020 Conditions for Accreditation – As prepared by The National Architectural Accrediting Board, Inc. (NAAB), dated 1/1/2025.

SC.6 **Building Integration**— Ability to make design decisions within architectural projects while demonstrating integration of building envelope systems and assemblies, structural systems, environmental control systems, life safety systems, and the measurable outcomes of building performance.

Through work completed for this course, students will also be required to demonstrate that they have an UNDERSTANDING of the following issues:

SC.1 **Health, Safety, and Welfare in the Built Environment**— How the program ensures that students understand the impact of the built environment on human health, safety, and welfare at multiple scales, from buildings to cities.

SC.3 **Regulatory Context**— How the program ensures that students understand the fundamental principles of life safety, land use, and current laws and regulations that apply to buildings and sites in the United States, and the evaluative process architects use to comply with those laws and regulations as part of a project.

SC.4 **Technical Knowledge**— How the program ensures that students understand the established and emerging systems, technologies, and assemblies of building construction, and the methods and criteria architects use to assess those technologies against the design, economics, and performance objectives of projects.

06. Course Schedule: (subject to adjustments based on studio progress)

Week Subject

1	Intro to Integrated Design / Site Analysis / Zoning Ordinances / Initial Code Research
2	Site Planning / Resiliency Standards (LEED, WELL, COTE)
3	Program Analysis / Passive System Design
4	G2 Field Trip - Program Analysis
5	ADA Accessible / Universal Design (Workshop) / Building Codes
6	Structures 1: Systems, Materials, Foundations (Code Worksheet 1)
7	Structures 2: Framing Diagrams, Lateral Loads, Shear
8	Life Safety Systems/Fire/Egress (Workshop & Code Worksheet 2) Stairs
9	Environmental Systems / MEP Integration / Lighting
10	Spring Break (March 16-20)
11	Acoustics / Material Decisions & Specs (Assign Big Section)
12	Walls & Roofs - Thermal Performance Software (Workshop)
13	Shell/Cladding - Details / (LEED/COTE Worksheets)
14	Big Wall Section Labs
15	Final Studio Reviews (G2 Wednesday April 22, 9am-4pm)
16	Final Advanced IBT Package Due

07. Required Textbooks, Software, and Tools

Books: This class does not have any required textbooks.

Books, magazines, articles, videos, and material samples will be provided by the faculty for class use, often to be reviewed before class in preparation for discussion. In addition, you are encouraged (required, in fact) to bring relevant reference materials for your own use and for the use of your colleagues.

Software: There are no required software programs, although you will need model- and vector-based digital drawing platforms to complete your design work. Although there is not a single required software tool, you may consider using a BIM modelling and documentation tool. A digital model will be needed as we will be using energy modeling software for performance analysis during the design process.

You will be using your Adv Graduate 2 studio projects as a basis for your work. Software for that work will require digital design, modelling, and rendering software as well, including Rhinoceros 3D, SketchUp Pro, Grasshopper, Maxwell, Lumion, etc., although the specific tools are at your discretion. You will need access to Adobe Photoshop and InDesign (or similarly capable programs) regularly.

We will post to Canvas and Miro to review and submit work.

Tools: Pencils, pens, paper, and an active, curious mind are required. We will often sketch on plots or with trace to test ideas. Iteration in IBT is critical for success, similar to studio. Specific materials will be discussed throughout the semester.

08. Recommended Reference Materials

Ching, Francis D. K. 2022. *Building Codes Illustrated: A Guide to Understanding the 2021 International Building Code*. 7th Edition. Hoboken, New Jersey: John Wiley & Sons, Inc.

- Allen, Edward and Joseph Iano. 2019. *Fundamentals of Building Construction: Materials and Methods*. 7th Edition. Hoboken, New Jersey: John Wiley & Sons, Inc.
- Allen, Edward and Joseph Iano. 2017. *The Architect's Studio Companion: Rules of Thumb for Preliminary Design*. 6th Edition. Hoboken, New Jersey: John Wiley & Sons, Inc.
- . 2017. *ICC A117.1-2017 Standard and Commentary: Accessible and Usable Buildings and Facilities*. International Code Council.
<https://shop.iccsafe.org/icc-a117-1-2017-standard-for-accessible-and-usable-buildings-and-facilities-1.html>
- Grondzik, Walter T. and Alison G. Kwok. 2019. *Mechanical and Electrical Equipment for Buildings*. 13th Edition. Hoboken, New Jersey: John Wiley & Sons, Inc.
- . 2023. *Florida Building Code – Building*. 8th Edition. International Code Council.
<https://codes.iccsafe.org/content/FLBC2023P1>
- . 2023. *Florida Building Code – Accessibility*. 8th Edition. International Code Council.
<https://codes.iccsafe.org/content/FLAC2023P1>
- . 2023. *Florida Building Code – Plumbing*. 8th Edition. International Code Council.
<https://codes.iccsafe.org/content/FLPC2023P1>
- . 2023. *Florida Building Code – Energy Conservation*. 7th Edition. International Code Council.
<https://codes.iccsafe.org/content/FLEC2023P1>

Additional References:

- Allen, Edward and Patrick Rand. 2016. *Architectural Detailing: Function, Constructability, Aesthetics*. 3rd Edition. Hoboken, New Jersey: John Wiley & Sons, Inc.
- Alread, Jason. Leslie, Thomas. and Whitehead, Rob. 2014. *Design Tech: Building Science for Architects*. 2nd Edition. New York: Routledge
- Brock, Linda. 2005. *Designing the Exterior Wall: An Architects Guide to the Vertical Envelope*. New York: Wiley Press.
- Ching, Frances D.K. 2014. *Building Construction Illustrated*, 5th edition. New York: Wiley Press.
- Deplazes, Andrea. 2005. *Constructing Architecture: Materials, Processes, Structures, a Handbook*. Basel: Birkhäuser.
- Ford, Edward R. 1990. *The Details of Modern Architecture*. Cambridge, Mass: MIT Press.
- Frascati, Marco. 1984. "The Tell-the-Tale Detail." In *VIA 7: The Building of Architecture*, 23-37. Philadelphia: University of Pennsylvania and MIT Press.
- Kieran, Stephen, and James Timberlake. 2004. *Refabricating Architecture: How Manufacturing Methodologies Are Poised to Transform Building Construction*. New York: McGraw-Hill.
- Ramsey, Charles, Harold Sleeper, John Hoke. 2016. *Architectural Graphic Standards*. 12th edition. New York: Wiley.
- Detail Magazine*. https://www.detail.de/de_en/

COURSE POLICIES

09. Attendance Policy

Our policy on attendance is strict: All students are expected to attend every scheduled class meeting. Any absence must be explained. We only meet once a week and every week is a different topic that is required for our NAAB integration with the G2 studio. Call the office and have a note left or contact me via email in advance. It is your responsibility to get any assignments from your fellow students. Note that TWO unexcused absences will result in a full letter grade deduction, and Three or more unexcused absences will result in a failing grade and/or an automatic drop from the course. Arriving late (within 30 minutes of the start of class) will be counted as a half of an absence; arriving more than 30 minutes late will be counted as an absence.

This said, if you're unwell please stay home and get better. If you email me in advance I may be able to record or Zoom the class so you won't miss important subject matter. If something is seriously wrong and may affect your attendance, please talk to me about it. Arrangements can be made to cope with illness, family issues, or personal crises.

10. Make-up Policy

It is not possible to make up a missed class session. Although a long conversation with a fellow student will help you begin to figure out what to do to prepare for the next session, it can never make up the learning that happens during discussions. A meeting in office hours may or may not be possible and cannot duplicate the conversation in class.

11. Course Technology & Software Use

The UF Canvas e-learning portal will be used for all digital coursework and sharing of certain common references available in electronic format. It will be accessible at <http://elearning.ufl.edu/>. Notify me if you do not have access to the course through this online portal.

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

12. Policy on Retaining Work

Please note that work that you create for this course may be retained indefinitely for academic purposes. You should be prepared for the instructor to ask that it be exhibited and/or photographed during or after the term. Having your work retained for photography and/or exhibition is evidence of its quality and value to the school. While you should be able to retrieve your original work temporarily for your own personal purposes, you should carefully photograph and document all project work prior to submission of any original materials for archival purposes.

GRADING POLICIES:

13. Your development as a designer and future architect relies on developing a disciplined way of working that involves a continual testing of ideas through your work. The assignments in IBT are intended to assist with your studio design projects and offer additional areas of potential for your developmental process. Treat the assignments as part of your design work and understand how they integrate decision-making.
14. Assessment will be through weekly assignments that integrate with your Adv Grad 2 studio and a final portfolio booklet that pairs with your final studio project. Grades are quite straightforward and will be based on the quality and completeness of work, your ability to integrate the technical aspects into your studio projects, and your contribution to the ongoing public dialogue that we will have in class and across to studio. Weight of the assessment will be 50% on weekly assignments, 40% on the final portfolio booklet, and 10% on class participation.
15. Continual progress each week in parallel with studio will have a significant impact on your final grade. We will be pleased to discuss your progress individually and make an assessment of your grade status after midterm review. We will discuss more specifics in class as needed. If you have questions at any point, make an appointment to meet with me.
16. Project Requirements and Grading



Project work completed for this course MUST successfully demonstrate the ability to develop integrated design proposals that meet and demonstrate compliance with code requirements and NAAB Student Criteria. Explicit requirements will be discussed for each project and students will be required to meet minimum requirements in order to successfully complete this course with a passing grade.

17. An incomplete grade may be assigned at the discretion of the instructor as an interim grade only in cases of extreme extenuating circumstances. Note that the incomplete grade must be resolved prior to enrolling in Advanced Graduate Architectural Design Three. In most cases, failure to complete this course before the beginning of the next semester requires a minimum one-year delay in progress through the program.

18. Graduate School Grading Scale + Qualitative Descriptions

	Letter Grade	Numeric Grade	Quality Points	Qualitative Description
PASSING GRADES	A	100-93	4.0	Outstanding work only
	A-	92-90	3.67	Close to outstanding
	B+	89-87	3.33	Very good work
	B	86-83	3.0	Good work
	B-	82-80	2.67	Good work with some problems
	C+	79-77	2.33	Slightly above average work
	C	76-73	2.0	Average work
FAILING GRADES	C-	72-70	1.67	Average work with some problems
	D+	69-67	1.33	Poor work with some effort
	D	66-63	1.0	Poor work
	D-	62-60	0.67	Poor work with some problems
	E	59-0	0.0	Inadequate work

Minimum
Cumulative
GPA

The current UF grading policies can be found at the UF Graduate Catalog: <https://catalog.ufl.edu/graduate/?catoid=10&navoid=2020#grades>

Please note that the University of Florida Graduate School requires that a graduate student maintain a 3.0 (B) overall average to remain in good academic standing. Every possible effort is made to counsel students in academic difficulty to determine the cause and possible solution so that the student can continue and complete their studies in the University. The Graduate School considers grades of C-minus or lower to be failing grades. A failing grade in this course means you have not met the minimum requirements for the student learning objectives and would be suspended from the architecture program. Students receiving one of these grades should immediately contact their Graduate Program advisor for guidance.

UF Academic Policies and Resources

For additional UF "Academic Policies & Resources," go to: <https://go.ufl.edu/syllabuspolices>. These resources include information about:

- Requirements for class attendance, make-up exams, and assignments
- Processes for students with disabilities who may require accommodations
- Current UF grading policies
- Expectations for course evaluations and constructive feedback
- The University's Honesty Policy regarding cheating, plagiarism, etc.
- In-class recording of class lectures for personal use
- Academic resources, including contact information
- Campus health and wellness resources, including contact information

Discussing difficult topics objectively and without endorsement

People learn best when they are encouraged to ask questions and express their diverse opinions on course content which may include images, texts, data, or theories from many fields. This is especially true in courses that deal with provocative or contemporary issues. UF offers many such courses, in which students encounter concepts of race, color, sex, and/or national origin. We teach these important issues because understanding them is essential for anyone who seeks to make economic, cultural, and societal contributions to today's complex world.

With this in mind, we do not limit access to, or classroom discussion of, ideas and opinions-including those that some may find uncomfortable, unwelcome, disagreeable, or even offensive. In response to challenging material, students and instructors are encouraged to ask honest questions and thoughtfully engage one another's ideas. But hostility, disruptive and disrespectful behavior, and provocation for provocation's sake have no place in a classroom; reasonable people disagree reasonably.

These guidelines can help instructors and students as they work together to fulfill the mission of the University of Florida, which includes the exploration of intellectual boundaries, the creation of new knowledge and the pursuit of new ideas.

The following summary of Florida HB7 (2022) is provided for additional information and context:

HB 7 – Individual freedom

"(4)(a) It shall constitute discrimination on the basis of race, color, national origin, or sex under this section to subject any student or employee to training or instruction that espouses, promotes, advances, inculcates, or compels such student or employee to believe any of the following concepts:

- 1. Members of one race, color, national origin, or sex are morally superior to members of another race, color, national origin, or sex.*
- 2. A person, by virtue of his or her race, color, national origin, or sex is inherently racist, sexist, or oppressive, whether consciously or unconsciously.*
- 3. A person's moral character or status as either privileged or oppressed is necessarily determined by his or her race, color, national origin, or sex.*
- 4. Members of one race, color, national origin, or sex cannot and should not attempt to treat others without respect to race, color, national origin, or sex.*
- 5. A person, by virtue of his or her race, color, national origin, or sex bears responsibility for, or should be discriminated against or receive adverse treatment because of, actions committed in the past by other members of the same race, color, national origin, or sex.*
- 6. A person, by virtue of his or her race, color, national origin, or sex should be discriminated against or receive adverse treatment to achieve diversity, equity, or inclusion.*
- 7. A person, by virtue of his or her race, color, sex, or national origin, bears personal responsibility for and must feel guilt, anguish, or other forms of psychological distress because of actions, in which the person played no part, committed in the past by other members of the same race, color, national origin, or sex.*
- 8. Such virtues as merit, excellence, hard work, fairness, neutrality, objectivity, and racial colorblindness are racist or sexist, or were created by members of a particular race, color, national origin, or sex to oppress members of another race, color, national origin, or sex.*

(b) Paragraph (a) may not be construed to prohibit discussion of the concepts listed therein as part of a larger course of training or instruction, provided such training or instruction is given in an objective manner without endorsement of the concepts."

CHANGES AND REVISIONS TO SYLLABUS

19. This syllabus is subject to change. Any changes will be relayed during regular class meetings and on Canvas.